

We claim:

1. A method for lighting an inductive plasma in a plasma processing apparatus having a matching network, the method comprising the steps of:

determining a matching condition under which the matching network is tuned to a capacitive plasma;

presetting the matching network at the matching condition determined in said determining step;

lighting a capacitive plasma in accordance with the preset matching condition and at a desired power exceeding a power required to maintain the capacitive plasma by an excess power; and

allowing an inductive plasma to light due to the excess power.

2. A method according to claim 1, wherein the plasma lit in said lighting step is a second plasma, and said determining step further comprises:

lighting a first plasma;

setting a power delivered to the first plasma at not more than about 20 watts;

allowing the matching network to tune to the first plasma as a capacitive plasma; and

recording the matching condition under which the matching network is tuned to the first plasma.

3. A method according to claim 1, wherein the plasma processing apparatus includes a coil for delivering power to the plasma, and a current produced in the coil due to the excess power causes the inductive plasma to light.

4. A method according to claim 1, wherein the matching condition determined in said determining step is a condition under which the capacitive plasma is maintained in a steady state.

5. A method according to claim 1, wherein the inductive plasma is lit in a chamber of the plasma processing apparatus having a gas pressure in the range of approximately 0.3 mTorr to 20 mTorr.

6. A method according to claim 1, wherein after said lighting step, the matching network changes from the preset matching condition to a matching condition under which the matching network is tuned to the inductive plasma.

7. A method according to claim 1, wherein the desired power is greater than about 20 watts.